COMPLEMENTARY PRODUCTS AND ASSEMBLY FITTINGS

CTG AC20 BR

PNR

INTRODUCTION

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TECHNICAL PUBLICATIONS

TECHNICAL PUBLICATIONS

PNR manufactures a complete range of spray nozzles for industrial applications, as well as products and systems specially designed for specific industries. Information about our Company and our product range is available through the following publications

PRODUCT RANGE	CTG TV BR
GENERAL PURPOSE SPRAY NOZZLES	CTG UG BR
AIR ASSISTED ATOMIZERS	CTG AZ BR
COMPLEMENTARY PRODUCTS AND ASSEMBLY FITTINGS	CTG AC BR
INDUSTRIAL TANK WASHING SYSTEMS	CTG LS BR
EVAPORATIVE COOLING LANCES	CTG LN BR
FIRE FIGHTING PRODUCTS	CTG FF BR
PAPERMILL PRODUCTS	CTG PM BR
STEELWORK NOZZLES	CTG SW BR
SPRAYDRY NOZZLES	CTG SP BR

As a result of continuous product improvement, our documentation is regularly updated and mailed to Customers whose name and address are registered on our Catalogue Mailing List. We shall gladly register your name, if you mail to the nearest PNR office or Distributor the form on page 33.

NOTES

NOTES

Our products and their performances are continuously reconsidered and modified to keep up with the latest state of technology. We regret not to be able to give our Customers previous advice about these modifications: data and product specifications given in this catalogue are always to be understood as indicative, and do not firmly engage our Company. Should your application imperatively require one or more characteristics of one of our products, as given by this Catalogue, to be strictly adhered to, we ask you to obtain a written confirmation before ordering.

All information contained into this catalogue, including product data, product codes, diagrams and photographs are the exclusive property of Flowtech Srl.
It is forbidden to reproduce any part of this catalogue without having obtained a permission in writing. Dimensions in this catalogue are given in millimeters (mm).
All threads manufactured according to the ISO 228 standards except where indicated. (European norms BS 2779 - DIN 259 - UNI 338).
Explanations about the abbreviations used in the catalogue and warranty conditions are given at page 33.
All Trademarks mentioned in this Catalogue are the property of their respective owners.

Our Company has qualified its Quality Management System according to the ISO 9001/2000 Norms.

DNV
Cert. 04111-99-AQ
MIL SINCERT

COMPLEMENTARY PRODUCTS

The majority of industrial processes based on the spraying of liquids require a large variety of supplementary operations such as drying by means of compressed air , mixing of fluids with Venturi eductors, heating or filtering of the liquid to be sprayed.
Our experience in the field of fluid dynamics and the continuous cooperation with a large number of customers on the major worldwide markets, enables us to propose a range of equipment which has not only been tested through many years of successful applications, but is continuously updated to the most modern technical levels and to the specific needs of modern industrial processes.

ASSEMBLY ACCESSORIES

The choice of the most suitable nozzle or atomizer is not the final task for the designer of a plant. Requirements such as the ease of assembling, the correct nozzle orientation, the ease of maintenance, and choosing those accessories designed to optimize the total efficiency of the plant process. Our experience, built up studying thousands of professional applications where a correct fitting has shown remarkable results, enables us to offer a range of high quality accessories. If the problem is contending with a previously specified fitting, which is not ideal, a system that needs protection against clogging, or other associated product problems that a designer has to face during the commissioning of a plant, you will find within the PNR range of accessories many suitable and professional solutions: these have been developed working together for many years together with companies like yourselves.

PNR MATERIALS CODES

Many of the products shown in this catalogue are available in different materials, and therefore their identification code in the Catalog is not complete. The two last digits in the code are used to specify the material, and these are left undetermined as XX.
When the required material has been selected complete the product code by adding the final digits. These should be read in conjunction with the corresponding materials available that are shown on the specific product page. If a special material, other than specified on our product data, is required please consult our sales staff.
The coding for the most popular materials are listed below.

A1	Mild steel
A8	Zinc coated steel
A9	Nickel coated steel
B1	AISI 303 stainless steel
B2	AISI 304 stainless steel
B21	AISI 304 L Stainless steel
B3	AISI 316 Stainless steel
B31	AISI 316 L Stainless steel
B8	AISI 309 Stainless steel
C2	AISI 416 Stainless steel, hardened
D1	Polyvinylchloride (PVC)
D2	Polypropylene (PP)
D21	Moulded polypropylene

D3	Polyamide (PA)
D5	Talcum filled Polypropylene
D6	PP, 25% glassfibers
D7	High density polyethylene
D8	Polyvinylidenefluoride (PVDF)
E0	EPDM
E1	Polytetrafluorethylene (PTFE)
E2	PTFE, 25% glassfibers
E31	Acetalic resin (POM)/Delrin
E7	Viton
E8	Synthetic rubber (NBR)
G1	Cast iron
H1	Titanium Grade 2

L1	Monel 400
L2	Incolloy 825
L61	Hastelloy C22
L8	Hastelloy C276
P6	Acrilyc but. styrene (ABS)
T1	Brass
T2	Brass, chrome plated
T3	Copper
T5	Bronze
T8	Brass, nickel plated
T81	Brass, electroless nickel plated
V1	Aluminum
V7	Aluminum, ENP

COMPLEMENTARY PRODUCTS

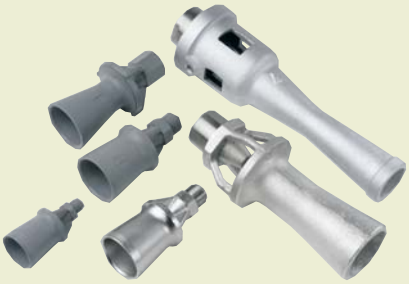
AIR BLOWERS

In many industrial processes some products have to be cleaned, dried, wiped-off, de-dusted, cooled or simply displaced to the other side of a conveyor. Compressed air is often used to perform such steps but it is relatively expensive and creates excessive noise in most operations. Recent developments in flow dynamics offer a reduction in air consumption and noise level, while increasing the process efficiency. This is done by means of air nozzles with a streamlined outside surface, which allows a small jet of high pressure air to entrain a larger volume of surrounding air.
The resulting air stream has a lower velocity with a high mass: the impact efficiency is preserved, while sound level and air consumption drop dramatically.
Page 3

PLANT CLEANING PRODUCTS

Pharmaceutical, chemical and food plants require high level of cleanliness to be kept at all times and to assure production control more and more strict norms are required for quality procedures. In addition to our wide range of tankwashers for the inside cleaning of tanks and vats, we offer a line of products designed for cleaning operations to provide plants with an efficient service in a clean and orderly appearance. These include professional cleaning guns and high quality stainless steel hose reels.
Page 5

MIXING EDUCTORS



A water eductor can sometimes be a simple solution to a variety of problems. We offer a line of eductors for several applications like producing hot cleaning water from an existing steam line, heating liquids in reservoirs by means of steam, keeping chemical solutions or paints properly mixed inside their vats and emptying tanks with a high pressure jet of water where a submersible pump is not available. Producing hot water under pressure from a steam line with a static device not requiring electric motors is a very useful solution for those applications where a tank needs to be washed in explosion-proof facilities.
Page 11

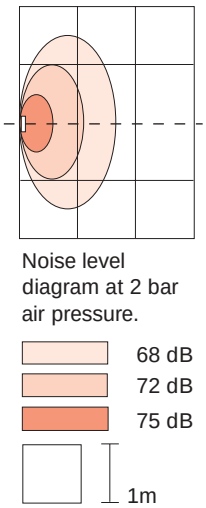
STATIC LINE FILTERS

A plugged nozzle in a process plant can cause anything from an annoying maintenance problem to severe break downs. Protecting your spraying system by means of an adequately selected filter or filtering system should always be considered while your production process is being designed. We show in this catalogue section a range of small and medium size line filters.
Large industrial filters and by-pass filtering systems, specifically designed for a single application are also outlined .They can be supplied in different materials to suit the specific application on hand, if necessary a self cleaning system can be fitted.
Page 13

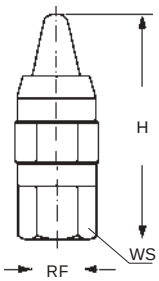
AIR BLOWING NOZZLES

UEA D020

These air blowers are designed to direct a powerful air stream over a well defined area. Their carefully studied profile obtains a laminar pattern of air with very low turbulence, entraining the surrounding ambient air to increase the local impact of the air stream. Because of the low turbulence, loss of energy and sound wave emissions are kept very low. The blower is made out of lightweight electroless nickel plated aluminum or 316L Stainless steel. The table shows the air capacities as a function of the air pressure, while the graph gives the noise level as a function of the front and side distances from the nozzle for an air pressure value of 2 bar.



Noise level diagram at 2 bar air pressure.



These air blowers meet the requirements of American OSHA regulations

Materials

Body
- **V7** Aluminum, electroless nickel plated
  LT 95° C - **LP** 15 bar
- **B31** AISI 316 L Stainless steel
  LT 110° C - **LP** 15 bar

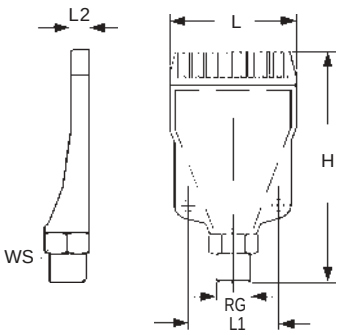
Code	RF inch	Air capacity Ncm/h					H mm	WS mm
UEA D020 B31xx	1/4	15	20	25	31	35	55	17
UEA D020 V7xx		15	20	25	31	35	55	17

Pressure (bar) 2,0 3,0 4,0 5,0 6,0

xx = Thread Codes
SG = BSP **SN** = NPT

UEA L022

These air blowers have been designed for applications where a flat blade-shaped air stream, with specifically high impact is offered which for example cover a given width on a moving conveyor. Here again the outside profile obtains a strong entrainment action over the surrounding atmosphere, generating a high impact laminar air blade, and avoiding the highly turbulent conditions of a free air jet with consequent loss of energy and high noise.



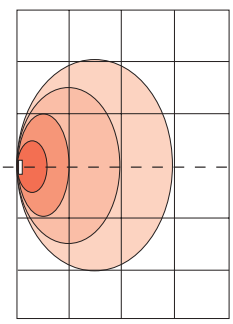
Materials
- **E31** Polyacetalic resin (POM)
  LT 80° C - **LP** 5 bar
- **V7** Aluminum, electroless nickel plated
  LT 95° C - **LP** 15 bar

Code	RG inch	Air capacity Ncm/h					H mm	L mm	L1 mm	L2 mm	WS mm
UEA L022 E31xx	1/4	10	17	22	28	33	90	48	35	6,5	16
UEA L022 V7xx		10	17	22	28	33	90	48	35	6,5	16

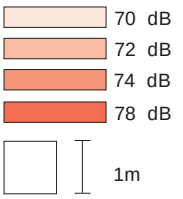
Pressure (bar) 1,0 2,0 3,0 4,0 5,0

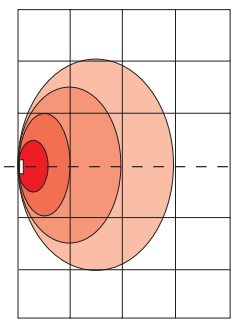
These air blowers meet the requirements of American OSHA regulations

xx = Thread Codes
SG = BSP **SN** = NPT

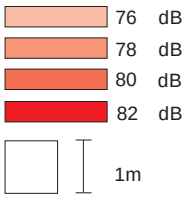


Noise level diagram at 3 bar air pressure.





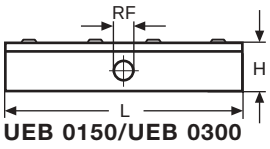
Noise level diagram at 6 bar air pressure.



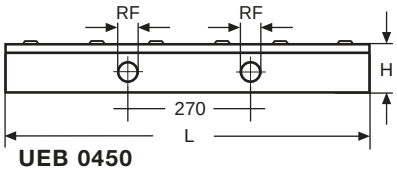
COMPLEMENTARY PRODUCTS

UEB

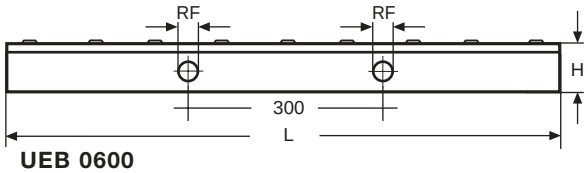
AIR BLOWING NOZZLES



UEB 0150/UEB 0300



UEB 0450



UEB 0600

UEB blowers produce a laminar jet of compressed air, with high efficiency and limited noise level. Their unique design provides an air stream exiting from a protected position, and changing direction because of adhesion to a radiused profile due to the Coanda effect. Their design allows for remarkable advantages:
- The exit orifice is not exposed to the risk of being damaged by impact.
- The bar can be built on any desired length, up to 600 mm.

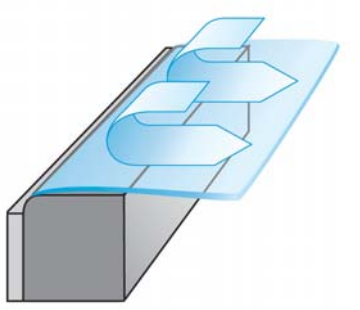
Materials

Body	**V7**	Electroless nickel plated aluminum
Upper Plate	**A9**	Nickel plated steel
		LT 95° C - **LP** 7 bar

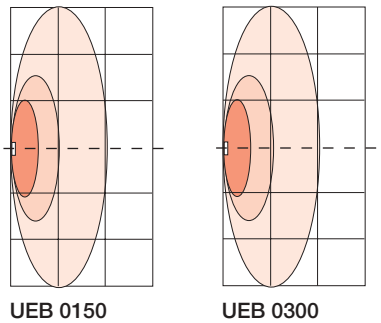
The table shows air capacity as a function of air pressure, while the graphs below show the noise level as a function of the front and side distances from the nozzle, while operated at an air pressure of 2 bar.
Since the air leaving the nozzle orifice drags along ambient air, the air blade produced by the nozzle (AIR OUT) has a larger flow rate which is a multiple of the feed air flow (AIR IN).

Code	RF	Air capacity Ncm/min										H	L	W
	inch	AI	AO	AI	AO	AI	AO	AI	AO	AI	AO	mm	mm	kg
UEB 0150 V7xx	1/4	0,26	4,70	0,34	6,00	0,42	7,10	0,51	8,60	0,60	10,6	30	150	0,3
UEB 0300 V7xx		0,52	9,40	0,68	12,0	0,84	14,2	1,02	17,2	1,20	21,2		300	0,7
UEB 0450 V7xx		0,78	14,1	1,03	18,0	12,6	21,3	1,53	25,8	1,80	31,8		450	0,9
UEB 0600 V7xx		1,03	18,7	1,40	24,0	1,68	28,4	2,04	34,4	2,40	42,4		600	1,4
Pressure (bar)		***2,0***		***3,0***		***4,0***		***5,0***		***6,0***				

xx = Thread Codes
SG = BSP
SN = NPT



The air blade exiting through the side slot follows the radiused profile and leaves the body with an angle of 90° from the original direction, as shown by the drawing. This remarkable feature, based on the Coanda effect, makes it possible to have the air outlet orifice in a totally protected position, which is very interesting as for instance in those cases where products oscillating on a chain conveyor can damage conventional air blowers.



UEB 0150 UEB 0300

Noise level diagram at 2 bar air pressure.

60 dB
70 dB
80 dB
1m

SAFETY NORMS

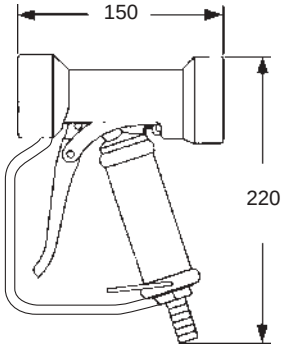
Safety norms determine the maximum sound level to which employees can be exposed in their working place. The noise level diagrams supplied show the noise level measured for one blower as a function of the distance from the blower itself. UEB series blowers meet OSHA noise requirements. Should your system consist of more than one blower, we recommend that the resulting noise level is checked for compliance with the requirement of the health and safety regulations where applicable.

WATER GUNS

UMV

The UMV series washgun has been designed primarily to avoid hot water waste, while assuring very comfortable operation conditions. Its thick rubber casing not only effectively protects the operator's hand from the discomfort of hot water but also assures an excellent protection in case the washgun is dropped or falls to the ground since it avoids any damage to the tiles or the equipment. The careful design, mainly used for the food industry, also includes a grease and detergent resistant quality rubber, plus a blue colour has been chosen as a visual aid to be seen clearly against a white or clear foreground. The trigger is lined too, and can be held in the open position by means of a lock-ring. The spray pattern can be adjusted continuously between a closed straight jet to a wide angle spray, so that the proper spray pattern can be choosen for each individual job.

Materials		
Body	**T2**	Brass casting, chrome plated
	B3	AISI 316 Stainless Steel
Lining	**E0**	EPDM
Stem	**B3**	AISI 316 Stainless steel
Trigger	**B3**	AISI 316 Stainless steel, rubber lined
	LT	80° C
	LP	25 bar
	LQ	21 lpm @ 3 bar UMV 2210 61 lpm @ 3 bar UMV 2211
Hose shank		13 mm – 1/2" hose fitting
Weight		0.9 kg



UMV 2210 xx

The versatility of this washgun is enhanced from the additional model UMV 2211, which can be fitted with nozzles or different lances through its 1/2" female thread. The three different lance models shown are easily fitted to the gun body with a 1/2" male nipple and offer the following choices of operation:

1 Foaming machines and equipment prior to washing operations. The foam lance comes with a quick connect female coupling, and a matching coupling must be fitted at the gun outlet.

2 General purpose 1/4" fem thread outlet, 1/4" male thread inlet. Available both with heat protection sleeve, or zinc-plated steel. The general purpose lance needs a connection nipple 1/4" fem to 1/2" male to be fitted on the gun. Please see the complete washgun and components codes below.

Complete guns

UMV 2210 xx	Standard, adjustable jet
UMV 220A xx	With foam lance
UMV 220B xx	With 1/4" fem outlet, bare lance
UMV 220C xx	With 1/4" fem outlet, heat protected lance

Please complete product codes , ending with (xx), filling in the code of required material eg **T2**, chrome plated brass, or **B3** for AISI Stainless steel 316.

Single components

UMV 2211 xx	With 1/2" female quick thread, without lance
XUM V001 B3	Foam lance
XUM V002 B3	Quick connect coupling for foam lance, 1/2" M
XUM V003 B3	Universal lance, 1/4" F out, heat protection
XUM V004 B3	Universal lance, 1/4" F out, zinc-plated steel
XUM V005 T2	Nipple, 1/4" F – 1/2" M, chrome plated brass

UMV 2211 xx + XUM V002 B3 + XUM V001 B3 = UMV 220A T2

+ XUM V005 T2 + XUM V004 B3 = UMV 220B T2

+ XUM V005 T2 + XUM V003 B3 = UMV 220C T2

COMPLEMENTARY PRODUCTS

XUM ACCESSORIES

XUM VQM3 B3

XUM VQF6 B3

FLEXIBLE HOSE

This hose has been selected for use with all types of UMV hot water guns, since it is made with top quality EPDM to resist high temperatures, and assuring long service life without wear.
Inlet and outlet ends are fitted with female quick coupling which can be supplied either with 1/2" or 3/4" size .

Max operation temperature **LT** 160° C
Max operation pressure **LP** 8 bar

Materials **Hose** **E0** EPDM
Couplings **B3** AISI 316 Stainless steel

Code	Size inch	LF m
XUM VT25 E0	1/2	25
XUM VT20 E0	3/4	20

QUICK COUPLINGS

Supplied as standard together with XUM P- hoses, can be ordered separately with the following codes:

Material **B3** AISI 316 Stainless steel

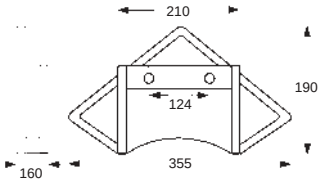
Code	Quick coupling connection	Thread inch	Diameter mm
XUM VQF1 B3	Female	1/2 M	
XUM VQF2 B3	Female	1/2 F	
XUM VQF3 B3	Female	3/4 M	
XUM VQF4 B3	Female	3/4 F	
XUM VQF5 B3*	Female		13
XUM VQF6 B3*	Female		19
XUM VQM1 B3	Male	1/2 M	
XUM VQM2 B3	Male	1/2 F	
XUM VQM3 B3	Male	3/4 M	
XUM VQM4 B3	Male	3/4 F	

* These couplings have a hose shank with the shown dia size.

HOSE STAND

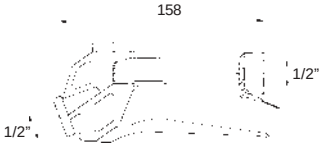
This keeps the gun hose away from the ground and maintains better hygienic conditions. Two 8,5 mm holes on the back plate make it possible to fix it on any wall.
Material **B2** AISI 316 Stainless steel

XUM US10 B2



UMS

UMS 0037 E3



UMS 0038 E3

For washing or wetting small surfaces, this gun offers the convenience of sturdy internal parts in stainless steel, covered by a plastic shell for optimum shock resistance. The gun has a 1/2" female outlet thread so a chosen nozzle can be mounted. Alternatively it can be fitted with a short plastic lance designed to house our range of nozzle tips, either full cone BX series or flat jet GX series, secured by means of a retaining nut.

Max operation temperature **LT** 100° C
Max operation pressure **LP** 50 bar
Max capacity **LQ** 70 lpm
Weight **W** 0.17/0.25 Kg
Inlet thread **RF** 1/2" F BSP

Materials Inner parts B1 AISI 303 Stainless steel
Inside seal E7 Viton
Outside shell E3 Acetalic resin

HIGH PRESSURE GUNS

UMW

A range of high pressure washing guns and lances have been fully tested for many years of satisfactory use. The sturdy construction, the carefully designed outer shell providing protection for operator's hands from high temperatures, and offers the possibility to lock the trigger in place for continuous service making these professional products well accepted for every market.

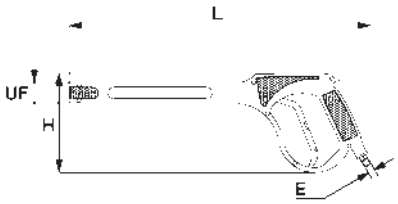
Materials

Body	**D4**	Nylon, Glassfibers reinforced
Inside parts	**B1**	AISI 303 Stainless steel
	C3	AISI 440 Stainless steel, hardened
	T1	Brass

UMW 0006 D4

UMW 0006 D4 gun offers a quick connection on the gun outlet for easy disassembling and replacing of the extension lances.

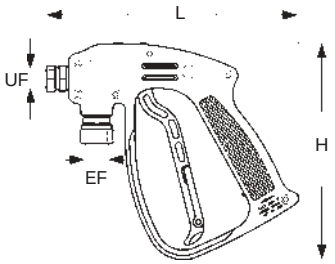
Nominal pressure		200 bar
Max operation temperature	**LT**	100° C
Max operation pressure	**LP**	220 bar
Capacity	**LQ**	24 lpm



Code	E inch	UF inch	H mm	L mm	W kg
UMW 0006 D4	3/8	1/4	155	914	1,45

UMW 0010 D4 is a basic washgun for general applications, offering optimum performance at a limited cost.

Nominal pressure		200 bar
Max operation temperature	**LT**	160° C
Max operation pressure	**LP**	220 bar
Capacity	**LQ**	30 lpm

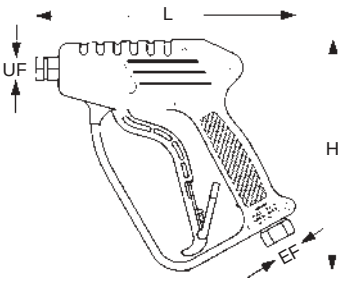


UMW 0010 D4

Code	EF inch	UF inch	H mm	L mm	W kg
UMW 0010 D4	3/8	1/4	162	185	0,27

UMW 0020 D4 feature the same robust design with a higher pressure operating range and a larger capacity.

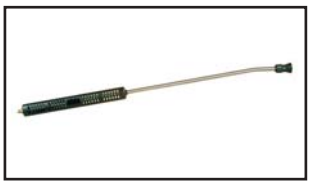
Nominal pressure		310 bar
Max operation temperature	**LT**	160° C
Max operation pressure	**LP**	350 bar
Capacity	**LQ**	40 lpm



UMW 0020 D4

Code	EF inch	UF inch	H mm	L mm	W kg
UMW 0020 D4	3/8	1/4	183	202	0,78

A range of different lances are available for assembly onto the UMW guns, please ask for detailed Data Sheets.
All lances have a 1/4" BSP male inlet and a 1/4" NPT female outlet, stainless steel pipe and temperature shield.



UMW 0030 B3
Basic model

UMW 0045 B3
Lance with heat shield and nozzle protection

UMW 0047 B3
Lance with filter

COMPLEMENTARY PRODUCTS

UMU

HOSE REELS

These high quality hose reels have been especially designed for those applications where stringent hygiene conditions need to be kept at all times, like pharmaceutical, chemical, cosmetic and food industries. The flexible hose can be maintained in a safe and proper place where dirt cannot collect. Entirely manufactured in polished stainless steel to avoid corrosion and rust. Their polished surface resists the build up of dust and dirt and should never be affected by corrosion or rust. Hose reels can be located on a wall or on a trolley for mobile operation.

Material **B2** AISI 304 Stainless steel

PRODUCT CODES

We offer on the following pages a complete range of reels and high quality food grade flexible hoses, designed for low and high pressure operation.

Every hose reel has a given internal housing, so the maximum hose length which can be housed depends by the hose size. For this reason hose reel codes do not include any hose, it must be ordered separately by the customer: hoses and reels will be delivered assembled.
In the table for each reel type, MF shows the suitable hose size/sizes whereas LF states the hose length possible for each given hose size.

The table at page 10 shows the ordering code per meter length of each hose type.

UMU A/B

MANUAL REWIND REELS

UMU A/B basic type of hose reel, with manual rewinding, fits perfectly the need for light cleaning operation or for assembly onto a mobile cleaning cart for operations on different places.
Swivel base and custom designed carts can be quoted on request.

UMU AD20 B2HSB

Code	LP bar	E inch	U inch	DI mm	MF inch	LF m	W kg	DE mm	H mm	S mm	Swivel code
UMU BF10 B2LSB	20	1	1	20	1	10	12	500	460	270	on request
UMU BF20 B2LSB					1	20	13	500	460	340	
UMU AC20 B2HSB	200	1/2	1/2	10	3/8	20	9	390	330	300	
UMU AD20 B2HSB					1/2	20					
UMU BC50 B2HSB					3/8	50	12	500	460	270	
UMU BD35 B2HSB					1/2	35					
UMU BC70 B2HSB					3/8	70	13	500	460	340	
UMU BD50 B2HSB					1/2	50					

Abbreviations shown in the table are specified at page 33.

HOSE REELS - AUTO REWIND

UMU G/H

UMU G/H, spring powered hose reels, are very useful in those applications where frequent cleaning operations are performed, saving time and increasing the operator efficiency. The hose can be easily pulled out of the reel for the required length, and will maintain its position without any effort from the operator while washing is taking place: a further short pull will cause the hose to rewind onto the reel. A swivel base can be supplied to each reel in this model range, see table for the right swivel.

UMU HD20 B2HSB

Code	LP bar	E inch	U inch	DI mm	MF inch	LF m	W kg	DE mm	H mm	S mm	Swivel code
UMU HE13 B2LSB **UMU HF08 B2LSB**	20	1	1	20	3/4 1	13 8	18 18	530	55O	300	XUM US20 B2
UMU HE18 B2LSB **UMU HF15 B2LSB**	20	1	1	20	3/4 1	18 15	24 24	530	550	480	XUM US22 B2
UMU GD15 B2HSB **UMU GD20 B2HSB** **UMU HC20 B2HSB** **UMU HD20 B2HSB**	200	1/2	1/2	10	1/2 1/2 3/8 1/2	15 20 20 20	13 18 18 18	550 550 530 530	430 430 550 550	230 260 300 300	XUM US15 B2 XUM US20 B2

Abbreviations shown in the table are specified at page 33.

AUTO REWIND & ORIENTABLE OUTLET

UMU L/K

UMU L/K reels offer, in addition to all the characteristics of the UMU G/H auto-rewind types, the convenience of an adjustable wall swivel device. This feature allows the operator to orientate the reel in an ideal working position.
It is then possible to pull the hose in any given direction, which increases the ease of operation and the flexibility of the installation.

UMU KD20 B2HSB

Code	LP bar	E inch	U inch	DI mm	MF inch	LF m	W kg	DE mm	H mm	S mm	Swivel code
UMU LE13 B2LSB **UMU LF08 B2LSB**	20	1	1	20	3/4 1	13 8	18 18	530	55O	300	XUM US20 B2
UMU LE18 B2LSB **UMU LF15 B2LSB**	20	1	1	20	3/4 1	18 15	24 24	530	550	480	XUM US22 B2
UMU KD15 B2HSB **UMU KD20 B2HSB**	200	1/2	1/2	10	1/2	15 20	13 18	500 500	480 480	250 280	XUM US15 B2 XUM US20 B2

Abbreviations shown in the table are specified at page 33.

COMPLEMENTARY PRODUCTS

UMU J/I

LARGE CAPACITY REELS

UMU J/I reels have been specially designed to hold a convenient length of flexible hose, up to 40 meters (depending upon hose diameter) can be handled by a specially designed double recovery spring which assures a reliable rewinding action. Recommended for applications where long tunnels or machines have to be cleaned from one single feed point.

UMU ID40 B2HSB

Code	LP bar	E inch	U inch	DI mm	MF inch	LF m	W kg	DE mm	H mm	S mm	Swivel code
UMU JE30 B2LSB	20	1	1	20	3/4	30	40	530	550	520	–
UMU JF25 B2LSB				20	1	25					–
UMU ID25 B2HSB	200	1/2	1/2	10	1/2	25	26	530	550	370	XUM US30 B2
UMU IC40 B2HSB				10	3/8	40	36				–
UMU ID40 B2HSB				10	1/2	40	36	530	550	420	–

Abbreviations shown in the table are specified at page 33.

XUM

FLEXIBLE HOSES

To complement our line of reels we make available the following range of flexible hoses, with different temperature and pressure operation ratings.
All hoses are made out of food grade NBR resistant to animal and vegetable greases, and offering a high gloss outside surface to avoid adhesion from dirt and any foreign particle.

Please note that codes below refer to 1 meter length

Order example:
The selected reel is UMU JE30 B2LSB, the first shown in the above table, and 14 meters of a 3/4” hose designed to withstand a pressure of 20 bar are requested.

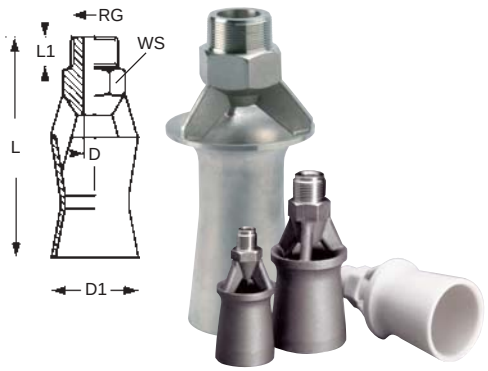
Hose reel	UMU JE30 B2LSB	**1 piece**	
Reel 3/4 hose capacity		**LF = 30 m**	See above UMU J/I table
Max. working pressure 20 bar		**Selected hose YXT RFEC E8**	See table below
Order code	YXT RFEC E8	**14 pieces**	

Hose code for 1 m length	LP bar	LT °C	3/8 inch	1/2 inch	3/4 inch	1 inch
YXT RDCB E8	10	95		•		
YXT RFCB E8					•	
YXT RGCB E8						•
YXT RDEC E8	20	100		•		
YXT RFEC E8					•	
YXT RGEC E8						•
YXT RCKE E8	210	155	•			
YXT RDKE E8	190			•		
YXT RCPE E8	400	155	•			
YXT RDNE E8	350			•		

MIXING EDUCTORS

UPB

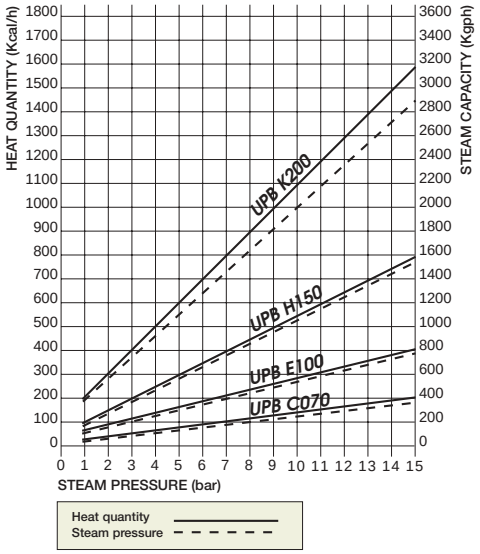
These eductors are the ideal devices for the continuous blending of liquids or solutions contained in tanks, when settling of heavier components and local variations of density must be avoided.
Stainless steel types are often used for steam heating processes in water tanks.
The distinctive design incorporates the efficiency of the Venturi profile into a body with high structural strength, where the eductor is cast or moulded offering sturdy thick sections. This minimizes the danger of the eductor being damaged in the course of maintenance work.



Maximum operating temperature LT 80° C (PP) - 90° C (PVDF)
Materials **B31** AISI 316L Stainless steel
D6 PP, chemically bonded fiberglass
D82 PVDF, moulded (3/8" Parallel Male thread)

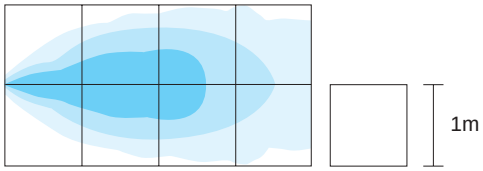
Code	RG inch	D mm	Flow rate at pressure lpm bar 1,0	2,0	3,0	4,0	5,0	D1 mm	L mm	L1 mm	WS mm
UPB C070 B31Sx	3/8	7,0	34	48	59	68	76	45	98	15	22
UPB C070 D6Sx		7,0	34	48	59	68	76				
UPB E100 B31Rx	1/2	10	63	89	109	126	141	60	132	20	30
UPB E100 B31Sx	3/4	10	63	89	109	126	141	60	132	20	30
UPB E100 D6Sx											
UPB H150 B31Sx	1 1/2	15	155	220	268	310	346	80	230	30	60
UPB K200 B31Sx	2	20	206	287	357	410	460	102	295	30	70

x = Thread Codes
B = **BSPT,** S. Steel only **- G** = **BSPP,** PP and PVDF **- N** = **NPT,** all materials



The table aside shows the eductor water capacity as a function of the pressure drop between the inlet pressure and the outlet back pressure.
See the diagram beside for steam heating, full lines show Heat Quantity, broken lines Steam Capacity, as a function of feed pressure.

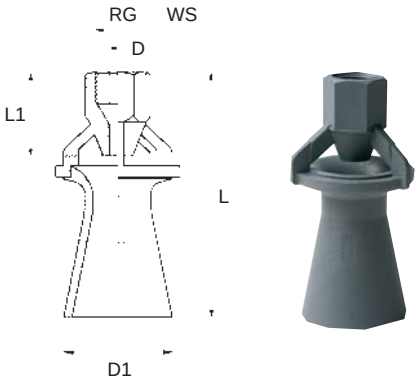
The graph on the left shows the effective range of type UPB E100, as tested in a water tank at 50 cm depth.
Under normal working conditions, for feed pressure values between 2 and 4 Bar, eductors with a total capacity equal to 20% of the liquid volume to be agitated has proven adequate for most applications.
Detailed suggestions about eductor layouts inside tanks are shown in product Data Sheet.



MIXING EDUCTORS

UPD

UPD series eductors are similar to the UPB series, the only difference is that they are supplied with a female thread connection.
This design offers the advantage of an easier removal from the feed pipe, should the eductor be broken while the plant is serviced.



Materials **B31** AISI 316L Stainless steel
D6 PP, chemically bonded fiberglass **LT** 80° C (PP)

Code	RF inch	D mm	Flow rate at pressure lpm bar 1,0	2,0	3,0	4,0	5,0	D1 mm	L mm	L1 mm	WS mm
UPD E100 D6xx	3/4	10	63	89	109	126	141	75	147	30	34
UPD H150 D6xx	1 1/2	15	141	199	243	280	313	80	225	45	60
UPD H150 B31xx	1 1/2	15	141	199	243	280	313	80	239	83	60
UPD K200 B31xx	2	20	206	287	357	410	460	102	295	83	70

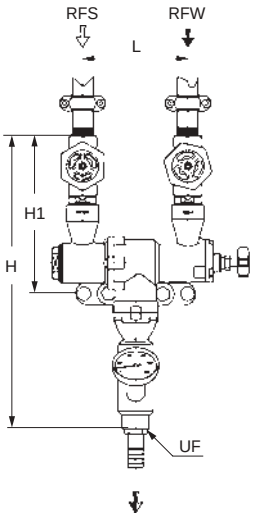
XX = Thread Codes
SG = BSP **SN** = NPT

Pressure (bar) 1,0 2,0 3,0 4,0 5,0

COMPLEMENTARY PRODUCTS

UPL

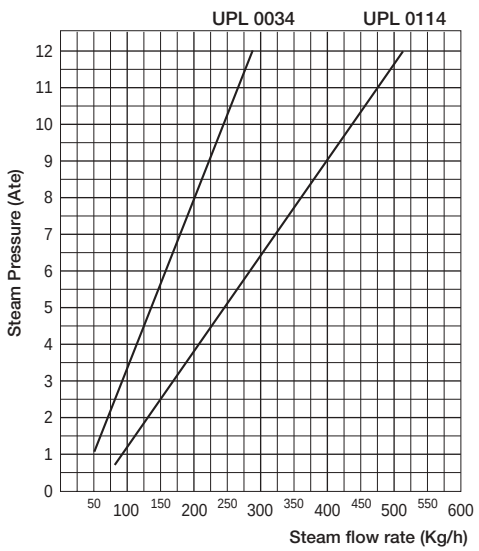
SMALL STEAM HEATERS



UPL steam operated water heaters offer a simple, cheap and noiseless solution to the problem of producing hot water in factories. Simply connecting the mixer inlet to cold water and steam lines assures a ready supply of hot sanitary water for your cleaning processes. All the steam energy is given to the water, the heating processes is extremely efficient and assures a low cost per liter and no stock is needed: just make the quantity you need. Two inlet valves allow for adjusting the temperature value, that can be read on the thermometer in front of the mixer. A safety valve automatically closes the steam inlet in event of water supply absence. Please read User Manual enclosed in the box before operating the units.

Max operation temperature	**LT**	90° C
Max steam pressure	**LP**	10 bar
Material	**B3**	AISI 316 Stainless steel

STEAM CONSUMPTION CHART



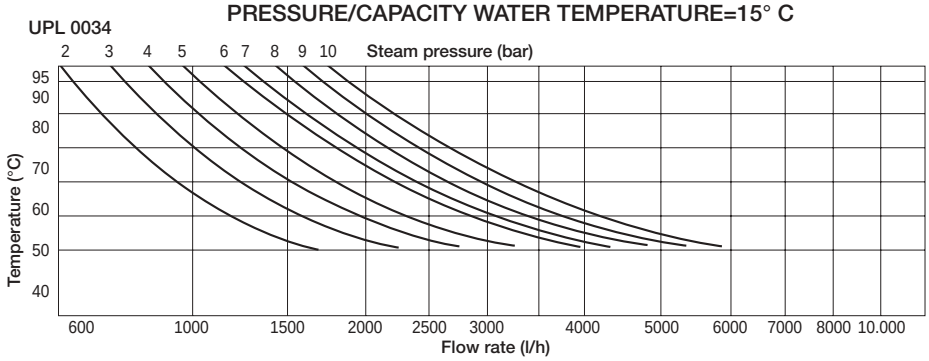
Code	RFW inch	RFS inch	UF inch	H mm	H1 mm	L mm	W kg
UPL 0034 B3	3/4	3/4	3/4	356	183	136	4,7
UPL 0114 B3	1¼	1¼	1¼	530	275	196	15,7

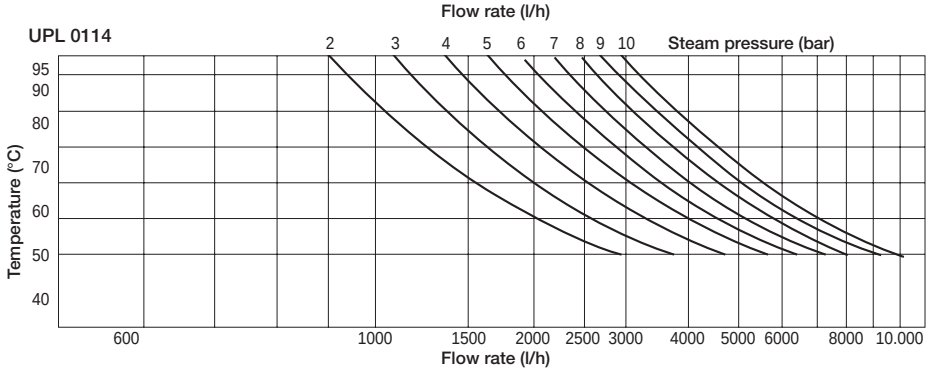
Steam inlet
Globe valve PN 25, with metal sealing seat.
Max temperature 180° C
Max working pressure 10 bar

Water inlet
Globe valve PN 16, with metal sealing or PTFE seat.

The tables beside give capacity of hot water (Lph) for inlet water temperature of 15° C, as a function of steam pressure.

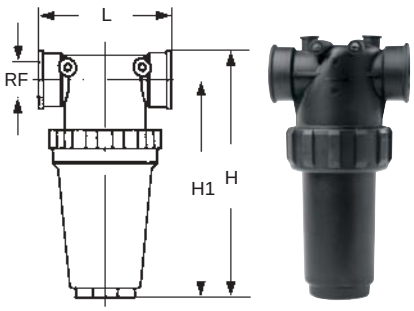
PRESSURE/CAPACITY WATER TEMPERATURE=15° C





PLASTIC BODY FILTERS — VEH

The line filters of the VEH series, are a rational and economical solution for such applications where severe operating conditions are not to be expected. Entirely made out of polypropylene, with two brass bushings (1/4" female thread), for wall mounting. The threaded coupling between the bowl and the head allows for quick cleaning or replacement of the filter cartridge without the need of any tool.



Max operation temperature **LT** 80° C
Max steam pressure **LP** 15 bar

Materials
Body **D21** Moulded Polypropylene
Seal **E0** EPDM

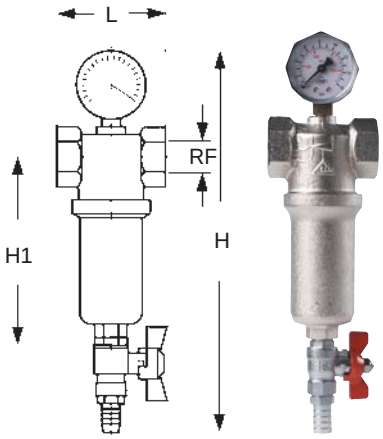
Code	RF inch BSPP	H mm	H1 mm	L mm	Q lpm	Cartridge	C	M mesh
VEH 0050 D21	1/2	136	118	99	140	XVE H050 DA2	B	32
VEH 0051 D21						XVE H051 DA2	U	50
VEH 0052 D21						XVE H052 DA2	R	100
VEH 0075 D21	3/4	136	118	99	140	XVE H050 DA2	B	32
VEH 0076 D21						XVE H051 DA2	U	50
VEH 0077 D21						XVE H052 DA2	R	100
VEH 0100 D21	1	165	143	107	140	XVE H050 DA2	B	32
VEH 0101 D21						XVE H051 DA2	U	50
VEH 0102 D21						XVE H052 DA2	R	100
VEH 0125 D21	1 1/4	279	239	146	250	XVE H060 DA2	B	32
VEH 0126 D21						XVE H061 DA2	U	50
VEH 0127 D21						XVE H062 DA2	R	100
VEH 0150 D21	1 1/2	279	239	146	250	XVE H060 DA2	B	32
VEH 0151 D21						XVE H061 DA2	U	50
VEH 0152 D21						XVE H062 DA2	R	100

Different cartridge colors are used to identify available filter gauge, the last column on the right shows mesh dimensions according to American mesh size.
Our cartridge code includes the mesh size, which does not need to be specified.

Color code: **B = White**
U = Blue
R = Red

BRASS BODY FILTERS — VEL

VEL type filters are the ideal solution for small systems where ease of cleaning is required. When necessary, simply open the valve at the bottom of the filter and the dirt contained inside the cartridge is easily expelled. The disassembly of the filter bowl is to be foreseen only to wash the cartridge loose of larger dirt particles. A manometer on the filter head shows the outlet pressure, hence pressure drop through the filter.
The filter cartridge is only available with a 150 mesh net.



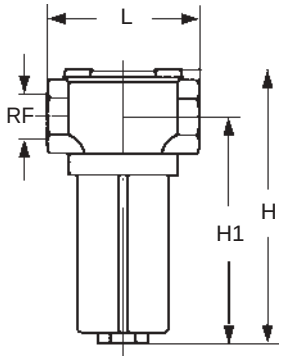
Code	RF inch BSPP	H mm	H1 mm	L mm	Q lpm	Cartridge	M mesh
VEL 0039 T8	3/8	285	133	50	14	XVE L171 B2	150
VEL 0051 T8	1/2	288	136	56	25		
VEL 0076 T8	3/4	288	132	67	38	XVE L172 B2	
VEL 0101 T8	1	295	137	80	72		
VEL 0126 T8	1 1/4	343	169	92	118	XVE L200 B2	
VEL 0151 T8	1 1/2	356	179	110	178	XVE L201 B2	
VEL 0201 T8	2	362	179	110	213		

Max operating temperature **LT** 100° C
Max operation pressure **LP** 16 bar

Materials
Body **T8** Nickel plated Brass
Cartridge **B3** AISI 316 Stainless steel

COMPLEMENTARY PRODUCTS

VEM



LARGE CAPACITY FILTERS

VEM FILTERS have been designed for high efficiency and ease of maintenance under hard conditions. The bowl houses large size cartridges, to extend periods of operation and reduce maintenance time, and has a thread connection to the body for quick removal without the aid of tools. Finally, a plug at the bottom of the bowl allows for fitting a ball valve to bleed the filter.

Max working pressure **LP** 20 bar

Materials Body & bowl **V1** Aluminum casting
Cartridge **B2** AISI 304 Stainless steel

Code	RF inch BSPP	H mm	H1 mm	L mm	LP bar	Q lpm	Cartridge	M mesh	W kg
VEM 0050 V1	1/2	210	152	105	40	70	XVE M075 B2	60	0,9
VEM 0051 V1							XVE M076 B2	80	
VEM 0075 V1	3/4	210	152	105	40	95	XVE M075 B2	60	
VEM 0076 V1							XVE M076 B2	80	
VEM 0100 V1	1	210	152	105	40	140	XVE M075 B2	60	
VEM 0101 V1							XVE M076 B2	80	
VEM 0125 V1	1 1/4	270	210	140	30	280	XVE M150 B2	60	1,6
VEM 0126 V1							XVE M151 B2	80	
VEM 0150 V1	1 1/2	270	210	140	30	315	XVE M150 B2	60	
VEM 0151 V1							XVE M151 B2	80	
VEM 0200 V1	2	400	318	200	10	750	XVE M300 B2	30	5,6
VEM 0201 V1							XVE M301 B2	60	
VEM 0202 V1							XVE M302 B2	80	
VEM 0250 V1	2 1/2	400	318	200	10	810	XVE M300 B2	30	
VEM 0251 V1							XVE M301 B2	60	
VEM 0252 V1							XVE M302 B2	80	
VEM 0300 V1	3	400	318	200	10	1050	XVE M300 B2	30	
VEM 0301 V1							XVE M301 B2	60	
VEM 0302 V1							XVE M302 B2	80	

SELF CLEANING FILTERS

Every industrial process need to be adequately protected by mean of a proper filtration. Please fill-in the form at page 32 with your requirements and send it to our offices, we will be glad to submit a quotation for customized self-cleaning filters.

CARTRIDGE SIZING TABLE

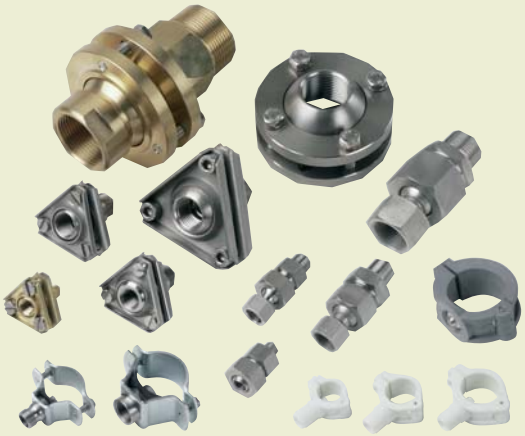
Mesh number	Free Passage mm
30 - 32	0.6 - 0.58
50	0.3
60	0.25
75	0.2
80	0.18
100	0.15
150	0.1
200	0.075

ASSEMBLY ACCESSORIES

NIPPLES, LOCKNUTS AND INTERNAL FILTERS

We offer a range of nipples and locknuts to suit most customers requirements and in different materials. Made out of high quality materials and under stringent tolerances, they assure a precise and reliable assembly for the nozzles in your system. Small size filters assure individual protection against clogging for single low capacity nozzles.
Page 16

PIPE CLAMPS AND SWIVEL JOINTS



The most extensive range of nozzle clamps engineered for industrial applications to give your own system a modern and efficient design, with the added advantage of easy and precise fitting. Our products will assist in keeping a plant clean and well maintained at peak performance and for sustainable period of time. Three series of swivels with a wide range of sizes that allow correct connection and quick orientation of the nozzles in your system, improving its performances. Swivel joints available in brass and several stainless steel qualities.
Page 20

SURFACE TREATMENT PRODUCTS

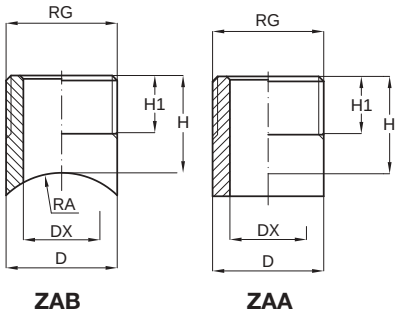
The widest range available for products specifically designed for pretreatment tunnels. Since the ZPF model has been introduced in 1982, PNR continues to supply the most modern products to major equipment manufacturers in the world, and to revolutionize the design of modern surface pre-treatment plants. The latest innovation in this field is a tongue nozzle with a patented quick-coupling that fits existing sphere equipped clamps, its 60° spray angle improves the efficiency of your system increasing the impact force of the spray.
Page 24

CUSTOM MADE FILTERS

Self cleaning filters designed to suit specific industrial needs, made out of carbon steel, plastic materials, stainless steel or any other material or alloy required by your process. A complete range of filtering elements with different styles and made out of various materials. Painting or coating cycles based on the operation environment. Everything required to offer an accurate and reliable filtering service.
Page 30

ASSEMBLY ACCESSORIES

ZAA/ZAB



ZAB ZAA

NIPPLES

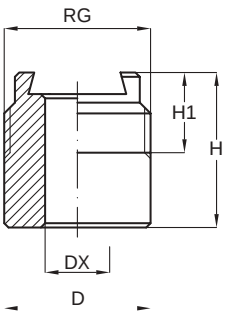
ZAA welding nipples allow the assembly of GX, BX or KX series nozzle tips onto pipes and spray manifolds. The 3/8" Bspp threaded nipple accepts filters of the series VEA, VEC, VED for protection of single nozzle tips. Welding nipples can be supplied radiused for the welding connection , the radius values are listed as RA in the code table.

Materials
B1 AISI 303 Stainless steel
B31 AISI 316 L Stainless steel

Radiused nipples
We offer nipples with a radiused base to allow for an easier and faster welding to manifold pipe. See RA values for radius in the table beside.

Code	RG inch	H mm	H1 mm	D mm	DX mm	RA mm	W g
Standard							
ZAA C018 xx	3/8	18	10	17	11,5	-	20
ZAA E027 xx	3/4	27	15	27	18,0	-	61
Radiused							
ZAB C018 xxD	3/8	18	10	17	11,5	10	20
ZAB C018 xxE						12,5	
ZAB C018 xxF						16	
ZAB C018 xxG						20	
ZAB C018 xxH						25	

ZAC



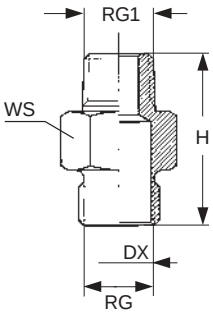
NIPPLES

ZAC welding nipples are manufactured with a mating dovetail end, to accept GY type dovetail nozzle tips and keep them orientated in the desired position.

Material
B31 AISI 316 L Stainless steel

Code	RG inch	H mm	H1 mm	D mm	DX mm	W g
ZAC C018 xx	3/8	18	10	17	7,5	20
ZAC E027 xx	3/4	27,5	14	27	14	61
ZAC G040 xx	1 1/4	40	21	42	20	280

ZLA / ZLC



NIPPLES

ZLA series nipples feature a male BSPT thread on the inlet side and accept VEA, VEC, VED filters for protection of single nozzle tips. ZLC 7575 nipples have both male threads straight BSP.

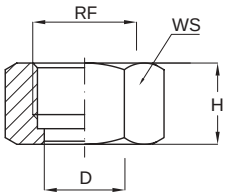
Materials
B31 AISI 316 L Stainless steel
T1 Brass

Code	RG inch	RG1 inch	DX mm	H mm	WS mm	W g
ZLA 3825 xxB	3/8	1/4	7,5	32,5	19	25
ZLA 3838 xxB	3/8	3/8	10	35	19	25
ZLC 7575 xxB	3/4	3/4	18	35	32	90

LOCKNUTS

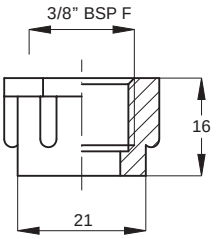
VAA

VAA locknuts have been designed for assembly onto our Z series nipples. They are available from stock in brass and stainless steel, and can be delivered on request out of any machineable material. A top quality polypropylene retaining nut, highly resistant to water absorption, is available to fit 3/8" nipple and ZPB clamp outlets.



Materials

	B1	AISI 303 Stainless steel
	B3	AISI 316 Stainless steel
	D6	PP, chemically bonded fiberglass
	T1	Brass



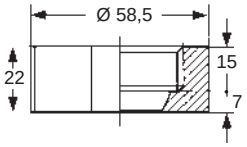
VAA 0380 D6B

Code	RF inch	D mm	H mm	WS mm
VAA 0380 xxB	3/8	12,9	12	22
VAA 0381 xxB	3/8	12,5	15	22
VAA 0750 xxB	3/4	20,5	16	32
VAA 1250 xxB	1 1/4	32,5	27	50

LOCKNUTS

VAB

VAB 0125 D6 locknut has been designed for use on ZPF, ZPL, ZPN and ZPQ type pipe clamps. Its special thread and the outside shape allow to easily assemble the cap by hand, without the use of any tools, making maintenance operations easier and faster. The high quality plastic material has a very low water absorption, a high dimensional stability under temperature and high tensile strength, so as to avoid any risk of the cap coming loose even under vibrations.



VAB 0125 D6

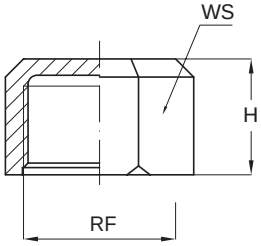
Max working temperature **LT** 80° C

Material **D6** PP, chemically bonded fiberglass

LOCKNUTS

VAE

VAE blind cap has been designed for the purpose of blanking off the ends of spray manifolds, in surface pre-treatment plants. It is moulded with the same high quality thermoplastic material as used for all products in the surface pre-treatment product line.



Max working temperature **LT** 80° C

Material **D6** PP, chemically bonded fiberglass

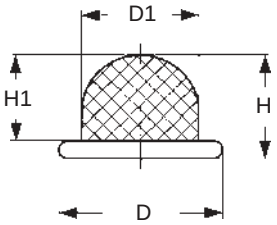
Code	RF inch	H mm	WS mm
VAE 1000 D6	1	25	42
VAE 1250 D6	1 1/4	32	52
VAE 1500 D6	1 1/2	32	60

ASSEMBLY ACCESSORIES

VE

INTERNAL FILTERS

VEA

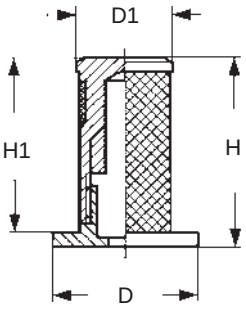


VEA

These filters can be assembled into all 3/8” nipple outlets and also into ZPB series clamps. Three different mesh dimensions are available , as shown in the table at the bottom of the page.

Materials	Collar	Copper
	Wire net	AISI 316 Stainless steel

VEC

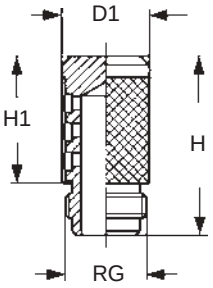


VEC

Used with nozzle tips, VEC type filters offer a large cartridge surface area as compared to the orifice cross section, and assure a long service time before maintenance is required.
These filters can be assembled into all 3/8” nipple outlets and into ZPB series clamps.

Materials	Body	**B1**	AISI 303 Stainless steel
		B3	AISI 316 stainless steel
		T1	Brass
	Wire net	**B2**	AISI 304 Stainless Steel

VEF



VEF

Threaded filters can be used with low-flow flat-jet 1/4” JB, HB series. Thread made to 3/8" UNF standard

Materials	Body	**B1**	AISI 303 Stainless steel
		B3	AISI 316 stainless steel
		T1	Brass
	Wire net	**B2**	AISI 304 Stainless Steel

Code	D mm	D1 mm	RG inch	H mm	H1 mm	M mesh
VEA 0138 T9	14,5	9,5	-	8,5	7,3	100
VEA 0238 T9						75
VEA 0338 T9						50
VEC 0138 xx	15	10	-	20	18,5	100
VEC 0238 xx						75
VEC 0338 xx						50
VEF 0138 xx	-	10,2	3/8 UNF	21	15	100
VEF 0238 xx						75
VEF 0338 xx						50

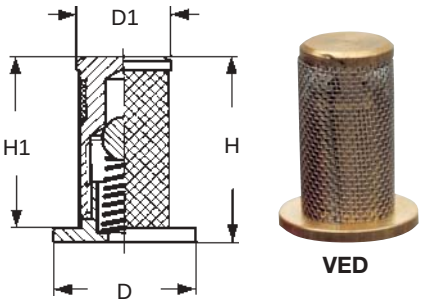
Please ask for detailed information about specific filters to be assembled on RX/RZ series nozzles.

INTERNAL FILTERS WITH CHECK VALVE

VE

VED

VED filters are fitted with an internal one way ball valve to avoid dripping when the spray is turned off, two different pressure rated springs are available to select the preferred opening pressure value, indicated by the C or the D as final digit in their code.



VED

Code	D mm	D1 mm	H mm	H1 mm	M mesh	Opening bar
VED 0138 xxC	15	10	20	18,5	100	1,4
VED 0238 xxC					75	
VED 0338 xxC					50	
VED 0138 xxD	15	10	20	18,5	100	2,8
VED 0238 xxD					75	
VED 0338 xxD					50	

VE series filters can be made out of different materials, standard parts from stock are detailed in the table below. Other materials can be offered upon request.

Material code	VEC	VED	VEF
B1/AISI 303	•	•	•
B3/AISI 316			•
D3/Nylon	•	•	
T1/Brass	•	•	•

CARTRIDGE SIZING TABLE

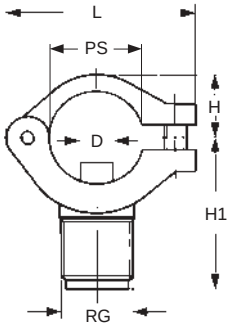
Mesh number	Free Passage mm
30 - 32	0.6 - 0.58
50	0.3
60	0.25
75	0.2
80	0.18
100	0.15
150	0.1
200	0.075

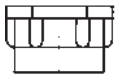
INTERNAL FILTERS

VE filters provide an individual protection for each single nozzle tip. We recommend the use of individual filters on low capacity nozzles and nozzle tips, where outlet orifices and internal passages have limited dimensions and plugging is therefore likely to happen. These should be used in addition to a main filter on the supply line of the system. For an efficient protection ,it is recommended to select a mesh size with a free-passage dimension smaller than the 70% of the free-passage dimension of the nozzle orifice.

ASSEMBLY ACCESSORIES

ZPB





VAA 0380 D6B

PIPE CLAMPS

ZPB series clamps allow nozzles to be assembled on manifolds in an easy, fast and professional way. Only one hole is required, no threading or welding, and a 3/8" male nipple is readily available for nozzle connection. The quality of polypropylene used for construction of our ZPB clamps offers good tensile strength at high temperatures, and low values of water absorption, assuring a secure assembly when in operation. A retaining nut moulded with the same material fits the nipple of all ZPB clamps.

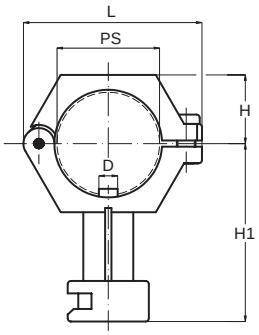
Max working temperature	**LT**	80° C
Max working pressure	**LP**	8 bar

Materials	Body	**D6**	PP, chemically bonded fiberglass
	O-ring	**E8**	NBR
	Metal parts	**B2**	AISI 304 Stainless steel

Code	RG inch	PS inch	PD mm	D mm	H mm	H1 mm	L mm	W g
ZPB 0050 D6	3/8	1/2	20/22	7,6	16,0	36	44	20
ZPB 0075 D6		3/4	25/27	7,6	17,5	39	51	26
ZPB 0100 D6		1	32/34	10,8	21,0	46	61	30
ZPB 0125 D6*		1 1/4	40/43	12,0	30,0	54	85	75

* Please note this model is also available with opposed 3/8" male outlet, ask for ZPE model data-sheet.

ZPC



BAYONET CLAMPS

ZPC series clamps are easily fastened onto a manifold and secured by means of a screw, offering the convenience of assembling a flat jet nozzle tip with a simple twist and maintaining the correct spray orientation. The flat jet orientation is set with a 10° deviation angle from the manifold axis to avoid jet overlapping. Designed and delivered as standard to match with PNR nozzle tips, two additional locknuts are available to match with tips from other manufacturers (Data Sheet on request)

Max working temperature	**LT**	90° C
Max working pressure	**LP**	8 bar

Materials	Body	**D82**	PVDF, moulded
	O-ring	**E7**	Viton
	Metal parts	**B3**	AISI 316 Stainless steel

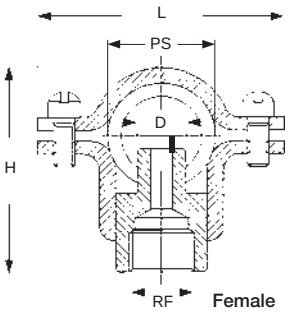
QUICK RELEASE COUPLING

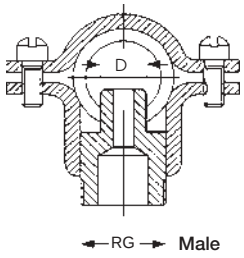
Code	PS inch	PD mm	D mm	H mm	H1 mm	L mm	W g
ZPC 0050 D82	1/2	20/22	7,6	16,0	36	44	21
ZPC 0075 D82	3/4	25/27	–	17,5	40	50	25

METAL CLAMPS

ZPM

ZPM clamp comprises two contoured pressings, a nipple and a gasket, the assembly being secured on the pipe by means of two screws: the tightening method allows for higher working pressures than those possible with plastic moulded clamps.
Nipples of different materials and thread sizes are available.
For a precise product identification please complete the clamp code as shown in the table below.





Max working temperature **LT** 80° C
Max working pressure **LP** 17 bar

Materials	Body	**B2**	AISI 304 Stainless steel
		A8	Zinc coated steel
	Screws	**B2**	AISI 304 Stainless steel
	Nipple	**B1**	AISI 303 Stainless steel
		T1	Brass
	Gasket	**E0**	EPDM

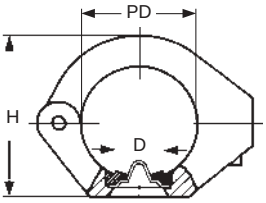
Code	PS inch	RF/RG inch	LP bar	LQ lpm	D mm	H mm	L mm
ZPM 0050 xxAW	1/2	1/8	17	11	7	40	49
ZPM 0050 xxBW		1/4					
ZPM 0050 xxUW		3/8				48	
ZPM 0075 xxAW	3/4	1/8	17	11	7	45	58
ZPM 0075 xxBW		1/4					
ZPM 0075 xxUW		3/8				53	
ZPM 0100 xxAW	1	1/8	17	11	7	45	65
ZPM 0100 xxBW		1/4					
ZPM 0100 xxUW		3/8				53	
ZPM 0125 xxYW	1 1/4	1/4	9	45	17	68	71
ZPM 0125 xxYW		3/8					
ZPM 0125 xxYW		1/2					
ZPM 0150 xxYW	1 1/2	1/4	9	45	17	72	90
ZPM 0150 xxYW		3/8					
ZPM 0150 xxYW		1/2					
ZPM 0200 xxYW	2	1/4	9	45	17	85	100
ZPM 0200 xxYW		3/8					
ZPM 0200 xxYW		1/2					
ZPM 0250 xxYW	2 1/2	1/4	9	45	31.5	110	118
ZPM 0250 xxYW		3/8					
ZPM 0250 xxYW		1/2					

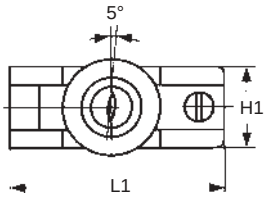
CODE COMPLEMENTS Replace xx and YW in the above codes as shown below

XX	For clamp material	Y	For nipple thread	W	For nipple material
A8	Zinc coated steel	A	1/8” BSP Fem	A	Brass
B2	AISI 304	B	1/4” BSP Fem	B	AISI 303
		C	3/8” BSP Fem	C	AISI 316
		D	1/2” BSP Fem		
		U	3/8” BSP Male		

ASSEMBLY ACCESSORIES

ZPH





FILTERPRESS CLAMPS

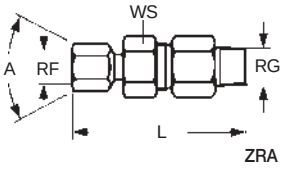
ZPH clamps have been specially designed to allow mounting the clog resistant flat jet disc nozzles of the series GE in a fast and economical way. GE nozzles are the best solution for washing band filter cloths used in mud drying filter presses. The clamp design lets the back part of the nozzle protrude inside the pipe, in order to enable the cleaning of the orifice by means of a rotating stainless steel brush.

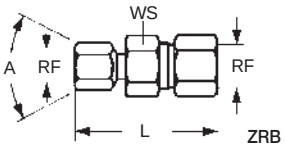
Max working temperature	**LT** 80° C	
Max working pressure	**LP** 7 bar	
Fitting dimensions	Outer pipe diameter	**50 mm**
	Inner pipe diameter	**47 mm**
	Feed hole	**19 mm**

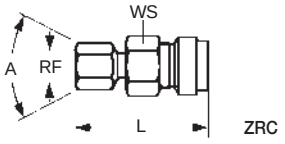
Materials	Clamp	**D6**	PP, chemically bonded fiberglass
	Pin, bolt	**B3**	AISI 316 stainless steel

Code	PD mm	D mm	H mm	H1 mm	L1 mm
ZPH 0150 D6	50	19	70	34	91

ZRA







SWIVEL JOINTS

ZRA swivel joints fit a wide range of nozzles, while maintaining a rational piping lay-out. Fitting and adjustment are easily performed, tightening the hexagonal screw cap. A female thread accepts the nozzle, and a male threaded connection fits onto the feed line.

Max working pressure	**LP**	21 bar
Materials	**B31**	AISI 316L Stainless steel
	T1	Brass

ZRB/ZRC

This swivel joint type can also be supplied with a female pipe connection (code ZRB) or a weld on connection (code ZRC), with the same range shown in the ZRA table beside.
Data Sheet for ZRB and ZRC types available on request.

Code	RG poll	RF poll	L mm	A deg	WS mm	W g
ZRA 1212 xx SB	1/8	1/8	38	50	22	57
ZRA 2525 xx SB	1/4	1/4	57			75
ZRA 2626 xx SB	1/4	1/4	67	60	27	147
ZRA 3826 xx SB	3/8	1/4	67			150
ZRA 3838 xx SB	3/8	3/8	70			155
ZRA 5050 xx SB	1/2	1/2	74	40	27	186
ZRA 7575 xx SB	3/4	3/4	92		40	468

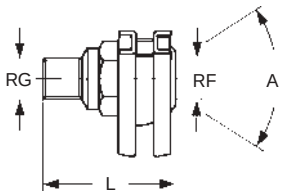
SWIVEL JOINTS

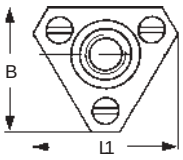
ZRP

ZRP swivel joints are a very popular type, where adjustment is carried out by locking the sphere between the two flanges.
A female thread accepts the nozzle, and a male threaded connection fits onto the feed line.

Max working pressure **LP** 15 bar

Materials **B2** AISI 304 stainless steel
T1 Brass





Code	RG inch	RF inch	L mm	B mm	L1 mm	A deg	W g
ZRP 1212 xx	1/8	1/8	30	40	35	50	65
ZRP 2512 xx	1/4	1/8	32				92
ZRP 2525 xx	1/4	1/4	40	50	45	60	140
ZRP 2538 xx	1/4	3/8	40				150
ZRP 3825 xx	3/8	1/4	40				150
ZRP 3838 xx	3/8	3/8	40				150

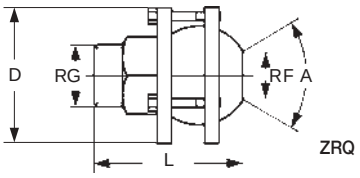
SWIVEL JOINTS

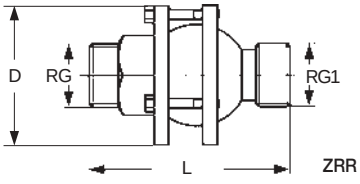
ZRQ

ZRQ swivel joints are designed to allow jet orientation for large nozzles. Fitting and adjustment are carried out by locking the clamping flange. These joints have a male thread connection to the feed pipe, a male or female connection for the nozzle.

Max working pressure **LP** 9 bar

Materials **B31** AISI 316L Stainless steel
T1 Brass

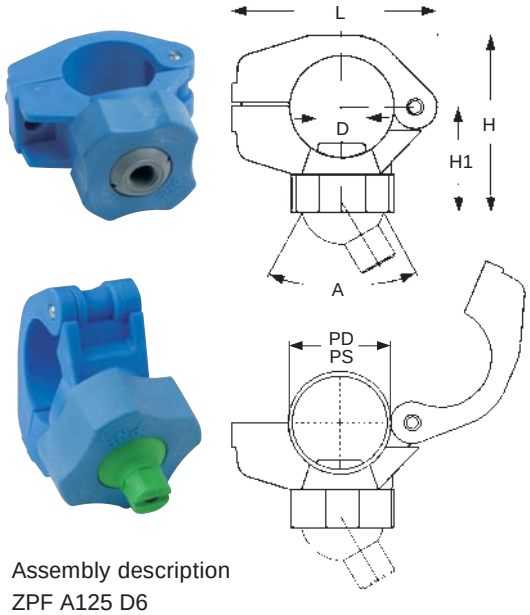




Code	RG inch	RG1 inch	RF inch	L mm	D mm	A deg	W kg
ZRQ 8080 xx	1		1	89	92	40	1,8
ZRQ 8282 xx	1 1/4		1 1/4	130			2,1
ZRQ 8482 xx	1 1/2		1 1/4	133			2,4
ZRR 8282 xx	1 1/4	1 1/4		130	92	40	2,2
ZRR 8284 xx	1 1/2	1 1/4		130			2,2
ZRR 8484 xx	1 1/2	1 1/2		130			2,4
ZRR 8686 xx	2	2 1/2		203	158	40	8,0
ZRR 8888 xx	2 1/2	2 1/2		229			8,8

ASSEMBLY ACCESSORIES

ZPF



Assembly description
ZPF A125 D6
VAB 0125 D6
HGQ 2195 D5/ZBA B038

PIPE CONNECTION

ZPF clamps are available with three different nipple sizes (D1) with diameters of 14.3, 17.0 and 20 mm. Single product codes are shown in the table beside.

SWIVEL NOZZLE CLAMPS

ZPF clamps, first introduced by PNR, have revolutioned the design of modern surface pre-treatment plants. They combine the convenience of nozzle orientation and the easiness of rapid mounting. It is possible to fit a broad range of nozzles with jets correctly oriented by just drilling one hole without welding a nipple to the manifold, and fixing the clamp with one screw. Checking and replacing of the nozzles is quick, and easily performed without the need of tools. ZPF can be fitted with swivel body moulded nozzles, or with female threaded spheres to accept any metal nozzle with threads between 1/8" and 1/2". For added strength, 1¹/₂" clamps have a stainless steel threaded captive nut moulded into the body.

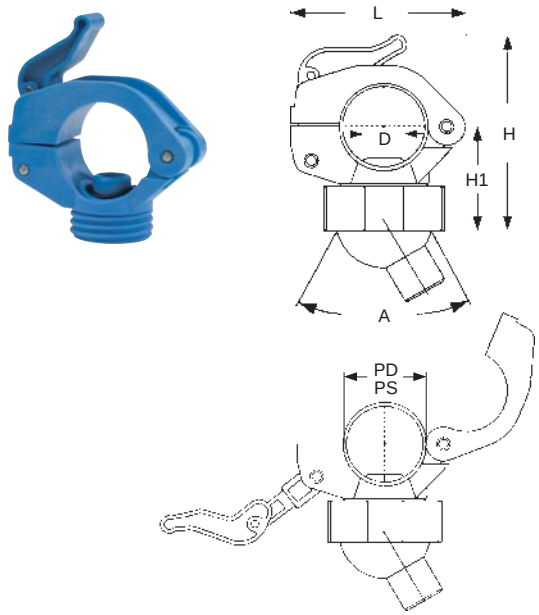
Max operating temperature **LT** 80° C
Max operating pressure **LP** 3 bar

Materials

Body	**D6**	PP, chemically bonded fibreglass
Pin & bolt	**B3**	AISI 316 Stainless steel
O-ring	**E8**	NBR

Code	PS inch	PD mm	D mm	H mm	H1 mm	L mm	A deg	W g
ZPF A125 D6 **ZPF B125 D6** **ZPF C125 D6**	1 1/4	41/43	20,0 17,0 14,0	83	54	84	40	85
ZPF A150 D6 **ZPF B150 D6** **ZPF C150 D6**	1 1/2	46/49	20,0 17,0 14,0	90	57	90	40	88

ZPQ



As easy as 1, 2, 3...just wrap the clamp around the pipe and lock the lever...you're done !

CAM & LEVER CLAMPS

ZPQ clamps are the most modern product developed for application in surface treatment plants: they reduce significantly the time and labour required for maintenance disassembling and cleaning operations. A patented cam and lever system quickly fits the clamp onto the pipe without tools. The clamp design, where body cam and lever are linked by stainless steel pins, avoids any risk of loosing single parts during assembly and disassembly. To avoid any leakage and consequent dirt buildup on the swivel ball, a unique soft seal is provided on the ball seat. ZPQ clamps use the same retaining nut and sphere nozzles as the other PNR clamps.

Max working temperature **LT** 70° C
Max working pressure **LP** 4 bar (tested at 20° C)
Locknut code **VAB 0125 D6**

Materials

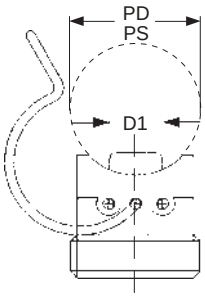
Plastic parts	**D6**	PP, chemically bonded fiberglass
Pins	**B3**	AISI 316 Stainless Steel
O-ring	**E8**	NBR
Seal	**D22**	Soft polypropylene

Code	PS inch	PD mm	D1 mm	H mm	H1 mm	L mm	A deg	W g
ZPQ A125 D6 **ZPQ B125 D6**	1¹/₄	42/43	20,0 17,0	93	41	84	40	87
ZPQ A150 D6 **ZPQ B150 D6**	1¹/₂	48/49	20,0 17,0	96	44	95	40	97

SPRING PIPE CLAMPS

ZPL

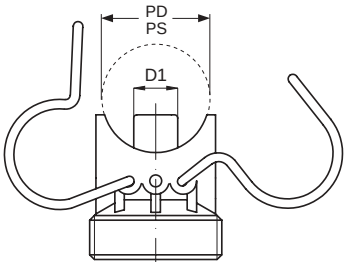
ZPL clamps are an efficient and price conscious solution for fitting nozzles into light duty plants. They use the same range of accessories (retaining caps, nozzle spheres, threaded spheres and o-rings) as the ZPF clamps, which allows for maximum flexibility in system design while reducing stock to a minimum. The clamp is fitted onto the pipe quickly and without any tools locking the profiled spring around the pipe, minimizing the time required when installing or servicing the plant.



ZPL

Max working temperature	**LT**	80° C
Max working pressure	**LP**	2 bar
Locknut Code		**VAB 0125 D6**

Materials	Body	**D6**	PP, chemically bonded fibreglass
	Spring	**N1**	AISI 302 Stainless steel, heat treated
	O-ring	**E8**	NBR



ZPN

Code Single spring	Double spring	PS inch	PD mm	D mm	A deg	W g
ZPL C100 D6	**ZPN C100 D6**	1	34/32	14,0	40	
ZPL A125 D6	**ZPN A125 D6**	1 1/4	43/41	20,0	40	
ZPL B125 D6	**ZPN B125 D6**			17,0		
ZPL C125 D6	**ZPN C125 D6**			14,0		46/65
ZPL A150 D6	**ZPN A150 D6**	1 1/2	49/46	20,0	40	
ZPL B150 D6	**ZPN B150 D6**			17,0		
ZPL C150 D6	**ZPN C150 D6**			14,0		

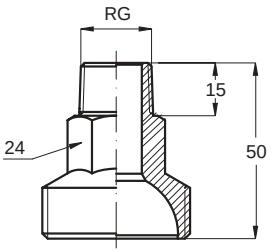
ZPN

For larger manifold sizes and when standpipes are subjected to excessive vibrations, we recommend using the double spring ZPN type clamp assuring a firmer connection on the pipe. Products code are listed in the table beside.

THREADED NIPPLE

ZLF

ZLF threaded nipple accepts all HG nozzles and ZBA threaded spheres and is designed to fit where standard clamps cannot be used or onto the feed manifold. Available with two different thread sizes, and with European or American threads, is made out of the same high quality polypropylene as all our pre-treatment products



Max working temperature	**LT**	80° C
Max working pressure	**LP**	4 bar
Locknut code		**VAB 0125 D6**

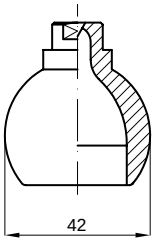
Material	**D6**	PP, chemically bonded fiberglass

Code	RG inch BSPT	RG inch NPT	W
ZLF A038 D6	3/8	-	15
ZLF B038 D6	-	3/8	
ZLF A050 D6	1/2	-	
ZLF B050 D6	-	1/2	

Assembly description
VAB 0125 D6
ZLF A050 D6
HGQ 2155 D5

ASSEMBLY ACCESSORIES

HG/RG



HGQ 2195 D5

HGQ 2155 D5

HGQ 2270 D5

HGQ 1390 D5

RGN 2390 D5

SWIVEL NOZZLES

This range of molded nozzles with spherical connection is designed to fit ZLF, ZPF , ZPQ and ZPL/N clamps with flat jet and hollow cone spray patterns available.
A wider range of catalogue listed stainless steel nozzles can be assembled by means of the several molded ZBA balls with female threads shown below.

FLAT JET NOZZLES

A wide range of flow rates, from 3.3 to 33.5 lpm a 2 bar, together with a 60° spray angle make HGQ series nozzles the most preferred choice in pre-treatment plants.
HGQ nozzles are available molded out of high quality polypropylene.

Materials **D5** Powder-filled polypropylene

Code	Flow rate lpm					Color	W g
HGQ 1390 D5	1,7	2,0	2,4	2,9	3,3	Black	16
HGQ 1770 D5	3,2	3,8	4,5	5,5	6,4	Violet	
HGQ 1980 D5	4,0	4,7	5,6	6,9	8,0	Brown	
HGQ 2117 D5	4,6	5,5	6,5	8,0	9,2	Yellow	
HGQ 2135 D5	5,5	6,5	7,8	9,5	11,0	Grey	
HGQ 2155 D5	6,2	7,4	8,8	10,8	12,5	Red	
HGQ 2195 D5	7,8	9,2	11,0	13,5	15,6	Green	
HGQ 2230 D5	9,5	11,3	13,5	16,5	19,1	Blue	
HGQ 2270 D5	10,9	12,8	15,4	18,8	21,7	Sky blue	
HGQ 2337 D5	13,9	16,4	19,6	24,0	27,7	White	
HGQ 2410 D5	16,7	19,8	23,6	29,0	33,5	Pink	
Pressure (bar)	***0.5***	***0.7***	***1.0***	***1.5***	***2.0***		

HOLLOW CONE NOZZLES

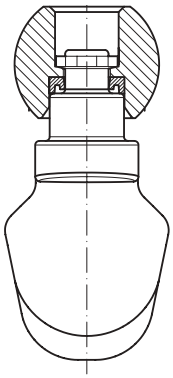
High flow rates and little risk of clogging is provided by large free-passage X-vanes which make these nozzles the perfect choice for rinsing and treatment processes. A 50° spray angle offers high impact values at considerable distances, even from low feed pressures. Totally moulded out of high quality polypropylene, assuring low liquid absorption and resistance to high temperature.

Material **D5** Powder filled Polypropylene

Code	Flow rate lpm					Color	W g
RGN 2175 D5	7,1	8,4	10,1	12,4	14,2	Red	25
RGN 2215 D5	8,7	10,4	12,4	15,2	17,5	Blue	
RGN 2390 D5	15,9	18,8	22,5	27,5	31,8	Orange	
Pressure (bar)	***0.5***	***0.7***	***1.0***	***1.5***	***2.0***		

FLAT JET QUICK-FIT SPOON NOZZLES — KS

A range of high impact molded spoon nozzles is now available for assembly on all our pre-treatment nozzle clamps. The nozzles are connected to the specific sphere ZBA QQN1 D5, equipped with a special seal that reduce pressure losses and avoid leakage, by means of a new Pnr patented quick-fit design. The new design offers the ideal combination for a pre-treatment nozzle, with a 60° spray angle and the highest possible impact for a given feed pressure, up to 60% with respect to a standard turbulence flat jet nozzle.
Switch to greater efficiency in minutes !



Materials **D6** PP, chemically bonded fiberglass

Code	Flow rate					lpm	Color	W g
KSQ 2155 D6QQ	6,2	7,4	8,8	10,8	12,5		Red	23
KSQ 2195 D6QQ	7,8	9,2	11,0	13,5	15,6		Green	
KSQ 2230 D6QQ	9,5	11,3	13,5	16,5	19,1		Blue	
KSQ 2270 D6QQ	10,9	12,8	15,4	18,8	21,7		Sky blue	
KSQ 2337 D6QQ	13,9	16,4	19,6	24,0	27,7		White	
KSQ 2390 D6QQ	15,9	18,8	22,5	27,6	31,8		Orange	
KSQ 2410 D6QQ	16,7	19,8	23,6	29,0	33,5		Pink	
KSQ 2433 D6QQ	17,7	21,0	25,0	30,6	35,3		Brown	

Pressure (bar)	0.5	0.7	1.0	1.5	2.0

QUICK RELEASE COUPLING

NEW PATENT PENDING

FLAT JET QUICK-FIT NOZZLES — HT

A complete range of flat jet nozzles : connected to the specific sphere ZBA QQN1 D5 fits any existing PNR plastic swivel clamp, you can improve your own machine design and reduce maintenance time with a negligible cost.
Product data-sheet is available for further information.

QUICK RELEASE COUPLING

THREADED AND QUICK-FIT SPHERES — ZBA

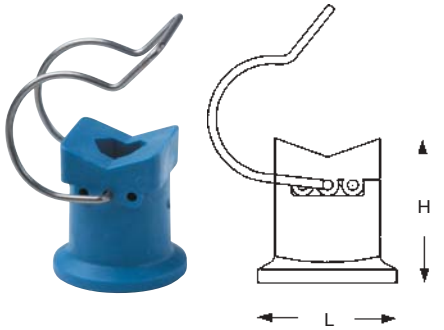
ZBA series are designed to accept male threaded metal nozzles and provide a very versatile nozzle combination system. Different nozzle types, and nozzles of differing materials, flow rates and spray angles can then be fitted into the whole clamp range that accept these threaded spheres. Threads are according to European (BSP) and American (NPT) norms. ZBA QQN1 D5 spheres are designed to fit our new series of quick-fit spoon and standard flat jet nozzles.
The next table shows available connections and includes the blind sphere ZBA 0000 D5.

Code	BSPP inch	NPT inch
ZBA A025 D5	1/4F	
ZBA B025 D5		1/4F
ZBA A038 D5	3/8F	
ZBA B038 D5		3/8F
ZBA A039 D5	3/8M	
ZBA A050 D5	1/2F	
ZBA 0000 D5	blind	
ZBA QQN1 D5	Quick connection	

ASSEMBLY ACCESSORIES

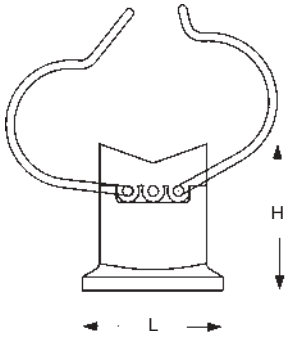
ZPG

PIPE HOLDERS



ZPG type pipe holders offer an easy and convenient solution for holding spray manifolds to the tunnel wall in surface treatment plants, while making maintenance operation faster. The high quality springs accommodate both steel and plastic pipes, with sizes ranging from 3/4" to 1 1/2". Manufactured out of a special grade stainless steel, these springs are heat treated and will not lose their elastic properties even after being disassembled several times. Each ZPG holder can be equipped with two springs, for use with heavy manifolds or with pipes that are subjected to excessive vibrations. The table below shows the product codes for one and two springs holders.

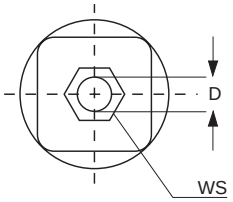
Materials Body **D6** PP, chemically bonded fiberglass
Springs **N1** AISI 302 Stainless steel, heat treated

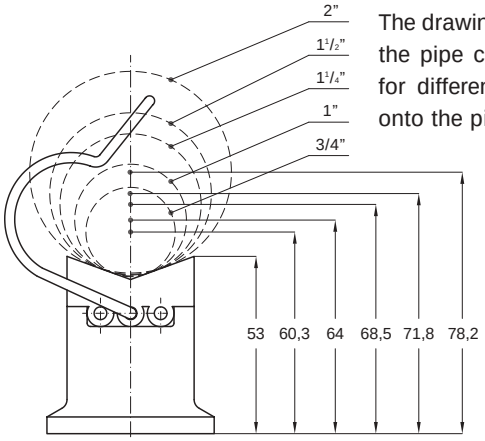


Code Single spring	Double spring	PS inch	D mm	H mm	L mm	WS mm	W g
ZPG 1075 D6	**ZPG 2075 D6**	3/4	11	53	50	17	72
ZPG 1100 D6	**ZPG 2100 D6**	1					72
ZPG 1125 D6	**ZPG 2125 D6**	1 1/4					90
–	**ZPG 2150 D6**	1 1/2					90
–	**ZPG 2200 D6**	2					110

Weight values are based on the double spring version

ZPG body design has provision for being secured to the wall by means of one M10 bolt with hexagonal 17 mm head



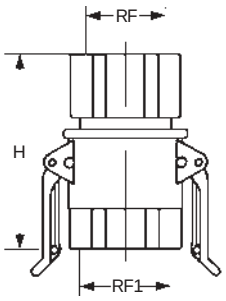


The drawing shows the distances of the pipe center axis from the wall, for different pipe sizes assembled onto the pipe holder.

QUICK COUPLING JOINTS

ZSA

ZSA quick coupling joints are a very popular solution for connecting standpipes to manifolds in surface treatment plants. There are inherent advantages for ease of operation and quick location facility. PNR couplings have been designed with industries requirements in mind, they offer sturdy bodies and high quality materials carefully chosen to withstand mechanical stress and chemical attacks. Standard types come with sintered 316 stainless steel levers and synthetic rubber seal. PVDF levers and Viton seals are available as an option.



Code	RF1 inch	RF inch	H mm	LP bar	W kg
ZSA 0075 B3x	3/4	3/4	85	15	*
ZSA 0100 B3x	1	1	73	15	
ZSA 0100 D6x			73	7	
ZSA 0125 B3x	1 1/4	1 1/4	110	15	
ZSA 0125 D6x				7	
ZSA 0150 D6x	1 1/2	1 1/4	110	6	
ZSA 0151 B3x	1 1/2	1 1/2	110	15	
ZSA 0151 D6x				6	

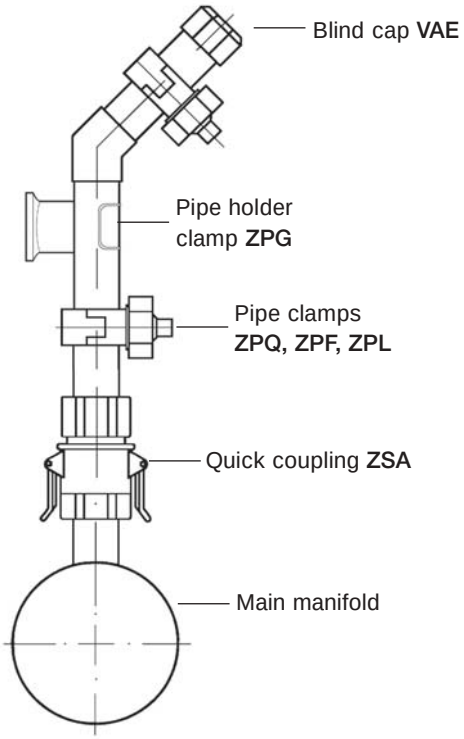
* *Weight values for different materials are given on request*

Materials

Body	D6	Polypropylene, chemically bonded glass fibers
	B3	Aisi 316 stainless steel
Levers	B31	Aisi 316L stainless, cast
	B35	Aisi 316 stainless, sintered
	D8	PVDF, Polyvinylidenefluoride
O-ring	E0	EPDM
	E7	Viton
	E8	NBR

ZSA quick couplers are available in a wide range of different assemblies, including types with fixed orientation, levers in special materials and others. Therefore , select the required option from the following list and substitute it to " x " in the product code when ordering.

X	Orientation	Lever material	O-ring	Rings
B	Fixed	AISI 316, sint	EPDM	AISI 316
C	Fixed	PVDF	EPDM	AISI 316
D	Fixed	PVDF	VITON	AISI 316
H	Fixed	AISI 316, sint	VITON	AISI 316
S	Free	AISI 316, sint	EPDM	AISI 316
T	Free	PVDF	EPDM	AISI 316
U	Free	PVDF	VITON	AISI 316
Y	Free	AISI 316, sint	VITON	AISI 316



QUICK FITTING RISERS AND HEADER MANIFOLDS

Our range of products for surface pre-treatment plants is the most complete on the market and has been developed in collaboration with the most important system manufacturers on a worldwide basis. As requested by our customers, PNR has designed most of the assembly accessories commonly adopted today in pre-treatment plants Thanks to our remarkable experience many of the most advanced plants have been equipped with a range of high quality products which is beyond comparison thanks to their rational and efficient design. All necessary parts for the professional assembly of risers and pipe manifolds are made available to our customers as shown on the diagram, and readily shipped from stock at competitive prices.

COMPLEMENTARY PRODUCTS

SELF CLEANING FILTERS

We make available to the industry small , medium and large size filters designed according to our customers requirements for several applications principally in the chemical, pharmaceutical and food industry and in addition wherever it is necessary to safely treat volumes of fluid.
Our scope of supply includes the filter design, according to the most important norms like PED and ASME, the manufacturing and the final site commissioning for medium and large size filters only.
All our filters are normally manufactured out of AISI 304 , 316L stainless steel for chemical compatibility with most fluids. The design is very robust for operating under severe conditions and undergoing frequent cleaning cycles with no wear.
The cover is fitted with bolts or swivel clamps while an o-ring assures the assembly to be completely watertight .
All parts, including the filter legs, are electro polished to avoid any corrosion point.

SELF CLEANING FILTERS / SINGLE CARTRIDGE

Our range of standard self-cleaning filters has been designed to satisfy the majority of industrial applications: flow rates range from 50 to 1000 cubic meter / hour and micron ratings from 2000 to 50 microns can be selected to match the design operating conditions of most critical processes with outstanding performances in terms of reliability and cost effectiveness.
Housings are normally manufactured out of AISI 304 or AISI 316L and equipped with viton, epdm or teflon o-rings, PVC housings are available on request to withstand longer service time with corrosive fluids .
Inlet and outlet flange can be positioned with 90° offset angles , accordingly to the feeding line layout.
Idle time between subsequent cycles , drainage valve opening time as well as the ratio between draining operation and cleaning cycles can be easily selected from the command module. Filters are delivered with pre-set parameters accordingly to the application they have been requested for.
Fill in the data collection questionnaire at page 32 and send it to your nearest PNR distributor office to receive the answer for your process filtering needs.

Maximum operation pressure	**LP**	**10 bar g**
Maximum operation temperature	**LT**	**80° C**

CUSTOM MADE FILTERS

With the range of filtering elements and materials available and our experience in designing and manufacturing sophisticated parts, we can quote and produce rational solutions for virtually all filtration problems.
Every special construction is defined after careful examination of customer data and requirements and designed according to the applicable international norms for pressure vessels. Final manufacture is then made after drawings are approved by the Customer.
We finally commission our filters on site and issue a Commissioning Report.
Fill in the data questionnaire on page 32 and send it to your nearest PNR distributor office to receive the answer for your process filtering needs.

CUSTOM MADE FILTERS

MULTIPLE CARTRIDGE FILTERS

Maximum operation pressure	LP 20 bar
Inlet and outlet ports size	1 1/2" and 2 inches normally BSP male thread
Upper relief plug/valve	3/8" BSP female

BAG FILTERS

Maximum operation pressure	LP 20 bar
Inlet and outlet ports size	1 1/2" and 2 inches normally BSP male thread
Upper relief plug/valve	3/8" BSP female
Bag size range	1 to 4

BASKET FILTERS

Maximum operation pressure	LP 20 bar
Inlet and outlet ports size	1 to 2 inches normally BSP male thread
Upper relief plug/valve	3/8" BSP female
Outlet port at filter bottom	Designed for total drainage
Standard basket	Designed for pressure drop 4 bar Special designs on request

Maximum operation pressure	LP 20 bar
Standard basket	Designed for pressure drop 4 bar Special designs on request
Inlet and outlet ports size	1" - 1 1/2" and 2" inches normally BSP male thread
Upper relief plug/valve	3/8" BSP female

Above mentioned multiple cartridge, bag filters and basket filters are recommended for fluids showing a vapor tension lower than 0.5 barg, at the highest allowed temperature.
CE marking and Declaration of Conformity not required, for these devices article 3, para 3 of PED Regulation 97/23/CE applies.

NORMS APPLIED
AD Merkblatt
ASME VIII Div 1,
VSR.

CONSTRUCTION MATERIALS
Austenitic stainless steels, series 304 and 316L
Duplex Stainless steels
Hastelloy
Inconel.

CERTIFICATION NORMS
97/23/ CE PED
ASME U-Stamp.

COATINGS
Hard rubber
Neoprene
Vitrification
Halar
PTFE.

FILTER SPECIFICATION FORM

Company name	Country
Mr./Mrs.	Contact info
Job/position	Phone Fax
Date	E-mail

OPERATION DETAILS

PROCESS INFO	Application			
	Line flow rate		cubic meter / hour	
	Process pressure range	min:	bar g --- max:	bar g
	Fluid properties	Specific weight gr/l	Suspended solids gr/l	Susp. solid dimensions mm
	Compressed air pressure	bar g	Electric supply	V
FILTER REQUIREMENTS	Required filtration degree		µm	
	Design temperature	degree C / F		
	Material of construction and/or corrosive agents in the fluid			
	Max dimensions	mm		height x diameter x weight
	Construction norms to apply , if any			
	NOTES			

ADDITONAL INFORMATION

LIST OF ABBREVIATIONS

AE	Air capacity, inlet	Ncm/min
AU	Air flow, outlet	Ncm/min
C	Cartridge ident color	—
CA	Internal volume	liter
DE	Depth	mm
DI	Nipple inner dia (hose reels)	mm
D,D1	Diameter	mm
DX	Nipple inner diameter	mm
E	Inlet thread size	inch
FF	Flange Nominal Dia	inch
H, H1	Height	mm

HE	Height	mm
LF	Hose length	m
LP	Max operation pressure	bar
LQ	Maximum capacity	lpm
LT	Max operation temperature	°C
M	Wire net mesh size	mesh
MF	Flexible hose size	inch
P	Depth	mm
PD	Pipe external diameter	mm
PS	Pipe size	inch
Q	Capacity	lpm

RA	Radius	mm
RF	Female thread	inch
RFS	Inlet thread steam	inch
RFW	Inlet thread water	inch
RG	Male thread	inch
S	Thickness	mm
SV	Swivel base model	—
U	Outlet thread size	inch
UF	Outlet fem thread size	inch
W	Weight	kg
WF	Water inlet	inch
WS	Wrench size	mm

PRODUCT WARRANTY

PNR products will be replaced or repaired at the option of PNR and free of charge if defective in manufacture, labeling or packaging. The above warranty conditions will apply if notice of defect is received by PNR within 30 days from date of product installation or one year from date of shipment. The cost of above said replacement or repair shall be the final solution for any breach of any warranty, and PNR shall not be held liable for any damages due to personal injuries or commercial losses caused by product malfunction.

OTHER PRODUCT RETURNS

Receiving returned products not precisely identified can originate delays in handling the single cases and even some product losses. In order to avoid such problems please follow the PNR procedures as described below.

PRODUCTS DELIVERED ERRONEOUSLY BY PNR

1 Obtain from PNR a RIN (Return ident number) and a 3DA A04 Form.
2 Return products to PNR including the 3DA A04 Form properly filled including RIN number.
3 PNR shall issue a Credit Note payable to you including product and all transport cost.

PRODUCTS ORDERED ERRONEOUSLY TO PNR

1 Returned products will only be accepted if in new original condition and properly packed.
2 Obtain from PNR a RIN (Return ident number) and a 3DA A04 Form.
3 Return products to PNR including the 3DA A04 Form properly filled including RIN number.
4 A 10% inspection and re-stocking charge and all transport cost are at charge of Customer.
5 A Credit note for the proper amount shall be issued and paid.

SPECIAL NON CATALOG PRODUCTS

The return of these products is only possible after PNR has issued an offer for purchase.

DISCLAIMER

Our products are manufactured with the best care and according to the latest developments of the technology, but we cannot assure that every one of our products is perfectly fit for any possible specific process.
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